Interfollicular epidermal stem cells self-renew via autocrine Wnt signaling.

Journal: Science

Publication Year: 2013

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PubMed link: 24311688

Funding Grants: Enhancing healing via Wnt-protein mediated activation of endogenous stem cells

Public Summary:
The skin is a classical example of a tissue maintained by stem cells. However, the identity of the stem cells that maintain the interfollicular epidermis and the source of the signals that control their activity remain unclear. Using mouse lineage tracing and quantitative clonal analyses, we showed that the Wnt target gene Axin2 marks interfollicular epidermal stem cells. These Axin2-expressing cells constitute the majority of the basal epidermal layer, compete neutrally, and require Wnt/β-catenin signaling to proliferate. The same cells contribute robustly to wound healing, with no requirement for a quiescent stem cell subpopulation. By means of double-labeling RNA in situ hybridization in mice, we showed that the Axin2-expressing cells themselves produce Wnt signals as well as long-range secreted Wnt inhibitors, suggesting an autocrine mechanism of stem cell self-renewal.

Scientific Abstract:
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